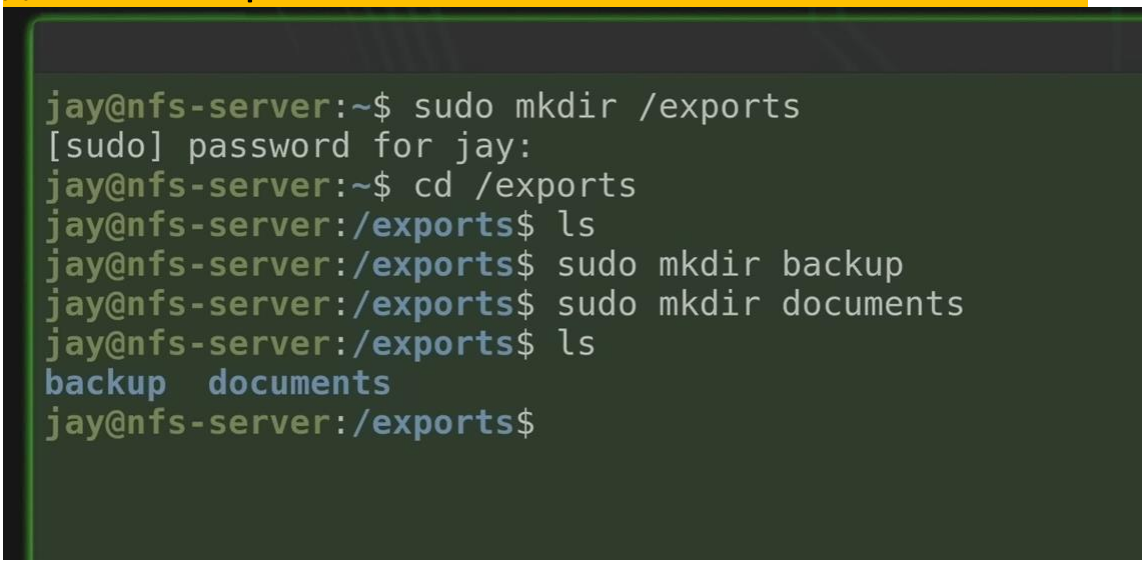
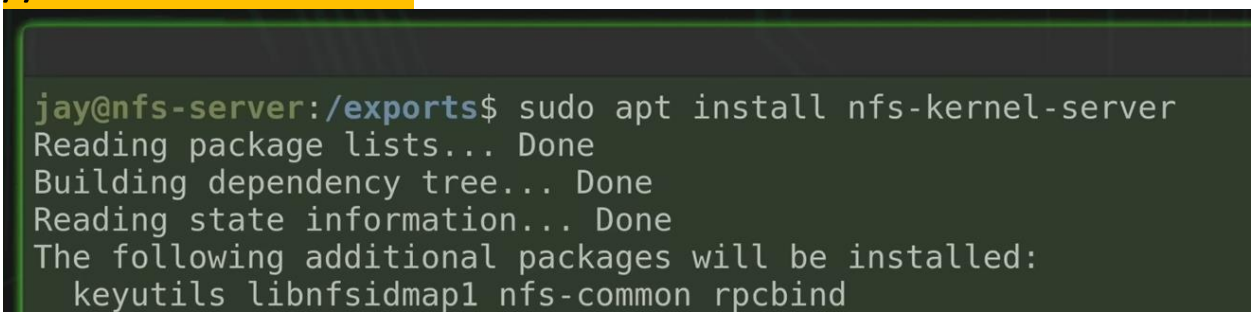
//How to Set Up an NFS Server on Ubuntu (Complete with AutoFS!)

From <https://www.youtube.com/watch?v=Na_jKeVWzrc&t=3s&ab_channel=LearnLinuxTV>

// create a parent folder and some sub directories



// install nfs-server



// check status...it show can't open /etc/exports... (this is normal)

```
neuvector@node3:~$ system status nfs-kernel-server
Command 'system' not found, did you mean:
  command 'systemd' from deb systemd (249.11-0ubuntu3.9)
  command 'system3' from deb simh (3.8.1-6.1)
Try: sudo apt install <deb name>
neuvector@node3:~$ systemctl status nfs-kernel-server
● nfs-server.service - NFS server and services
     Loaded: loaded (/lib/systemd/system/nfs-server.service; enabled; vendor preset: enabled)
     Active: active (exited) since Thu 2023-08-17 01:39:18 UTC; 37s ago
   Main PID: 3348 (code=exited, status=0/SUCCESS)
        CPU: 15ms

Aug 17 01:39:18 node3 systemd[1]: Starting NFS server and services...
Aug 17 01:39:18 node3 exportfs[3347]: exportfs: can't open /etc/exports for reading
Aug 17 01:39:18 node3 systemd[1]: Finished NFS server and services.
neuvector@node3:~$
```

// default export file, do a backup

```
jay@nfs-server:~$ cat /etc/exports
# /etc/exports: the access control list for filesystems which may be exported
#               to NFS clients.  See exports(5).
#
# Example for NFSv2 and NFSv3:
# /srv/homes       hostname1(rw,sync,no_subtree_check) hostname2(ro,sync,no_subtree_check)
#
# Example for NFSv4:
# /srv/nfs4        gss/krb5i(rw,sync,fsid=0,crossmnt,no_subtree_check)
# /srv/nfs4/homes  gss/krb5i(rw,sync,no_subtree_check)
#
jay@nfs-server:~$
```

```
jay@nfs-server:~$ sudo mv /etc/exports /etc/exports.orig
jay@nfs-server:~$
```

// create a new one

```
jay@nfs-server:~$ sudo nano /etc/exports
```

```
  GNU nano 6.2                                    /etc/exports *
/exports/backup 10.10.10.0/255.255.255.0(rw,no_subtree_check)
/exports/documents 10.10.10.0/255.255.255.0(rw,no_subtree_check)
```

https://www.golinuxcloud.com/nfs-exports-options-examples/

2. Export NFS Share to all hosts

To export a NFS share to whole world (this is a dangerous term in production but actually that is what this means). We will use " * " to enable NFS access to the share to all the networks out there which has access to your NFS server

bash

```
# cat /etc/exports
/dump/backups *(sync)
```

So here we have added no restriction in the exports file for the NFS Share for any of the hosts

// restart it

```
jay@nfs-server:~$ sudo systemctl restart nfs-kernel-server
jay@nfs-server:~$
```

// create some dummy files

```
jay@nfs-server:~$ cd /exports
jay@nfs-server:/exports$ ls
backup  documents
jay@nfs-server:/exports$ sudo nano backup/test1.txt
jay@nfs-server:/exports$ sudo nano documents/test2.txt
jay@nfs-server:/exports$
```

// now the nfs-server is ready... let's move to client part

// goes to another machine, install nfs client

```
jay@nfs-client:~$ sudo apt install nfs-common
[sudo] password for jay:
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following additional packages will be install
  keyutils libnfsidmap1 rpcbind
```

// use showmount to list the exports , need to provide the nfs-server IP

```
jay@nfs-client:~$ showmount --exports 10.10.10.222
Export list for 10.10.10.222:
/exports/documents 10.10.10.0/255.255.255.0
/exports/backup    10.10.10.0/255.255.255.0
jay@nfs-client:~$
```

// create /mnt/nfs ， use same name like backup, documentes
// but this is not required..

```
jay@nfs-client:~$ sudo mkdir /mnt/nfs
jay@nfs-client:~$ sudo mkdir /mnt/nfs/backup
jay@nfs-client:~$ sudo mkdir /mnt/nfs/documents
jay@nfs-client:~$ ls -l /mnt/nfs
total 8
drwxr-xr-x 2 root root 4096 Aug 30 17:20 backup
drwxr-xr-x 2 root root 4096 Aug 30 17:20 documents
jay@nfs-client:~$ ls -l /mnt/nfs/backup
total 0
jay@nfs-client:~$
```

// do the mount

```
jay@nfs-client:~$ sudo mount 10.10.10.222:/exports/backup /mnt/nfs/backup
jay@nfs-client:~$ df -h
Filesystem                         Size  Used Avail Use% Mounted on
tmpfs                              393M  1.1M  392M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv   15G  6.0G  8.0G  43% /
tmpfs                              2.0G     0  2.0G   0% /dev/shm
tmpfs                              5.0M     0  5.0M   0% /run/lock
/dev/sda2                          2.0G  127M  1.7G   7% /boot
tmpfs                              393M  4.0K  393M   1% /run/user/1000
10.10.10.222:/exports/backup        15G  6.0G  8.0G  43% /mnt/nfs/backup
jay@nfs-client:~$ ls -l /mnt/nfs/backup
total 4
-rw-r--r-- 1 root root 12 Aug 30 17:13 test1.txt
jay@nfs-client:~$ cat /mnt/nfs/backup/test1.txt
hello world
jay@nfs-client:~$
```

```
jay@nfs-client:~$ sudo mount 10.10.10.222:/exports/documents /mnt/nfs/documents
jay@nfs-client:~$ df -h
Filesystem                         Size  Used Avail Use% Mounted on
tmpfs                              393M  1.1M  392M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv   15G  6.0G  8.0G  43% /
tmpfs                              2.0G     0  2.0G   0% /dev/shm
tmpfs                              5.0M     0  5.0M   0% /run/lock
/dev/sda2                          2.0G  127M  1.7G   7% /boot
tmpfs                              393M  4.0K  393M   1% /run/user/1000
10.10.10.222:/exports/backup        15G  6.0G  8.0G  43% /mnt/nfs/backup
10.10.10.222:/exports/documents     15G  6.0G  8.0G  43% /mnt/nfs/documents
jay@nfs-client:~$ ls -l /mnt/nfs/documents
total 4
-rw-r--r-- 1 root root 13 Aug 30 17:14 test2.txt
jay@nfs-client:~$
```

// unmount

```
jay@nfs-client:~$ sudo umount /mnt/nfs/backup
jay@nfs-client:~$ sudo umount /mnt/nfs/documents
jay@nfs-client:~$ df -h
Filesystem                         Size  Used Avail Use% Mounted on
tmpfs                              393M  1.1M  392M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv   15G  6.0G  8.0G  43% /
tmpfs                              2.0G     0  2.0G   0% /dev/shm
tmpfs                              5.0M     0  5.0M   0% /run/lock
/dev/sda2                          2.0G  127M  1.7G   7% /boot
tmpfs                              393M  4.0K  393M   1% /run/user/1000
jay@nfs-client:~$
```

// use AutoFS

// remove original backup and documents (on the client), because autofs will help to create

```
jay@nfs-client:/mnt/nfs$ ls
backup  documents
jay@nfs-client:/mnt/nfs$ sudo rm -r backup documents
jay@nfs-client:/mnt/nfs$ ls
jay@nfs-client:/mnt/nfs$
```

// install

```
jay@nfs-client:~$ sudo apt install autofs
```

```
jay@nfs-client:~$ systemctl status autofs
● autofs.service - Automounts filesystems on demand
     Loaded: loaded (/lib/systemd/system/autofs.service;
     Active: active (running) since Tue 2022-08-30 17:28
       Docs: man:autofs(8)
    Process: 3528 ExecStart=/usr/sbin/automount $OPTIONS
   Main PID: 3529 (automount)
      Tasks: 3 (limit: 4575)
     Memory: 1.3M
        CPU: 7ms
     CGroup: /system.slice/autofs.service
             └─3529 /usr/sbin/automount --pid-file /var/

Aug 30 17:28:47 nfs-autofs systemd[1]: Starting Automoun
Aug 30 17:28:47 nfs-autofs systemd[1]: Started Automount
lines 1-14/14 (END)
```

// configure

```
jay@nfs-client:~$ sudo nano /etc/auto.master
```

// add this line in the bottom, the /mnt/nfs is the base folder on the client

```
# precedence.
#
+auto.master

/mnt/nfs /etc/auto.nfs --ghost --timeout=60
```

// edit another file

```
jay@nfs-client:~$ sudo nano /etc/auto.nfs
```

```
  GNU nano 6.2                                    /etc/auto.nfs *
backup -fstype=nfs4,rw 10.10.10.222:/exports/backup
documents -fstype=nfs4,rw 10.10.10.222:/exports/documents
```

// review

```
jay@nfs-client:~$ tail -n 1 /etc/auto.master
/mnt/nfs /etc/auto.nfs --ghost --timeout=60
jay@nfs-client:~$ cat /etc/auto.nfs
backup -fstype=nfs4,rw 10.10.10.222:/exports/backup
documents -fstype=nfs4,rw 10.10.10.222:/exports/documents
jay@nfs-client:~$
```

```
jay@nfs-client:~$ df -h
Filesystem                         Size  Used Avail Use% Mounted on
tmpfs                              393M  1.1M  392M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv   15G  6.0G  8.0G  43% /
tmpfs                              2.0G     0  2.0G   0% /dev/shm
tmpfs                              5.0M     0  5.0M   0% /run/lock
/dev/sda2                          2.0G  127M  1.7G   7% /boot
tmpfs                              393M  4.0K  393M   1% /run/user/1000
jay@nfs-client:~$ sudo systemctl restart autofs
jay@nfs-client:~$ sudo systemctl status autofs
● autofs.service - Automounts filesystems on demand
     Loaded: loaded (/lib/systemd/system/autofs.service; enabled; vendor preset: enab
     Active: active (running) since Tue 2022-08-30 17:45:19 UTC; 11s ago
       Docs: man:autofs(8)
    Process: 3651 ExecStart=/usr/sbin/automount $OPTIONS --pid-file /var/run/autofs.p
   Main PID: 3653 (automount)
      Tasks: 4 (limit: 4575)
     Memory: 1.3M
        CPU: 10ms
     CGroup: /system.slice/autofs.service
             └─3653 /usr/sbin/automount --pid-file /var/run/autofs.pid

Aug 30 17:45:19 nfs-autofs systemd[1]: Starting Automounts filesystems on demand...
Aug 30 17:45:19 nfs-autofs systemd[1]: Started Automounts filesystems on demand.
lines 1-14/14 (END)
```

// use df to check,, hmm.. still nothing

```
jay@nfs-client:~$ df -h
Filesystem                         Size  Used Avail Use% Mounted on
tmpfs                              393M  1.1M  392M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv   15G  6.0G  8.0G  43% /
tmpfs                              2.0G     0  2.0G   0% /dev/shm
tmpfs                              5.0M     0  5.0M   0% /run/lock
/dev/sda2                          2.0G  127M  1.7G   7% /boot
tmpfs                              393M  4.0K  393M   1% /run/user/1000
jay@nfs-client:~$ mount | grep nfs
/etc/auto.nfs on /mnt/nfs type autofs (rw,relatime,fd=6,pgrp=3653,timeout=60,minproto=5,maxproto=5,indi
rect,pipe_ino=33615)
jay@nfs-client:~$
```

>> the reason is that, the autofs will only do mount when you actually trying to access it.

>> try to access it

```
jay@nfs-client:~$ ls -l /mnt/nfs
total 8
drwxr-xr-x 2 root root 4096 Aug 30 17:13 backup
drwxr-xr-x 2 root root 4096 Aug 30 17:14 documents
jay@nfs-client:~$
```

>> now we can see it

```
jay@nfs-client:~$ df -h
Filesystem                         Size  Used Avail Use% Mounted on
tmpfs                              393M  1.1M  392M   1% /run
/dev/mapper/ubuntu--vg-ubuntu--lv   15G  6.0G  8.0G  43% /
tmpfs                              2.0G     0  2.0G   0% /dev/shm
tmpfs                              5.0M     0  5.0M   0% /run/lock
/dev/sda2                          2.0G  127M  1.7G   7% /boot
tmpfs                              393M  4.0K  393M   1% /run/user/1000
10.10.10.222:/exports/backup        15G  6.0G  8.0G  43% /mnt/nfs/backup
10.10.10.222:/exports/documents     15G  6.0G  8.0G  43% /mnt/nfs/documents
jay@nfs-client:~$
```

// my NFS server (10.1.45.49)

```
neuvector@node3:/etc$ cat exports
/exports/backup *(rw,sync,no_subtree_check,no_root_squash)
/exports/documents *(rw,sync,no_subtree_check,no_root_squash)
neuvector@node3:/etc$ ls -l /exports
total 8
drwxr-xr-x 3 root root 4096 Oct 26 04:08 backup
drwxr-xr-x 2 root root 4096 Aug 17 01:37 documents
neuvector@node3:/etc$
```

```
neuvector@node3:/exports/backup$ /sbin/showmount -e localhost
Export list for localhost:
/exports/documents *
/exports/backup    *
neuvector@node3:/exports/backup$
```